



DuoVibe – Vibe/Phase/Whatever

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1 General Information

1.1 Circuit Overview / History

The DuoVibe is yet another expansion on Tim Escobedo's "Wobbletron" circuit snippet first published in 2005. I (culturejam) have done several circuit iterations on this cool little building block snippet (which is also very similar to the basic phase shift stage in a Univibe), and I feel that this one is a nice compromise between super-complexity and functionality.

The DuoVibe is a two-stage optical vibe circuit than can also cop subtle phaser tones. The LFO is modified from the Shoot the Moon tremolo (itself derivative of the Tremulus Lune) and is capable of triangle wave and near-square wave output. The pitch bend in Vibe mode is discernible but not capable of "seasick" wobble. With the depth cranked, you can think of it as a sort of "tremolo with funk going on" kind of thing.

There is a Vibe/Phase Mode switch, the name of which indicates its function and purpose. This switch simply toggles a feedback filtering cap value, but is useful despite the simplicity. See the mods section below for more detail.

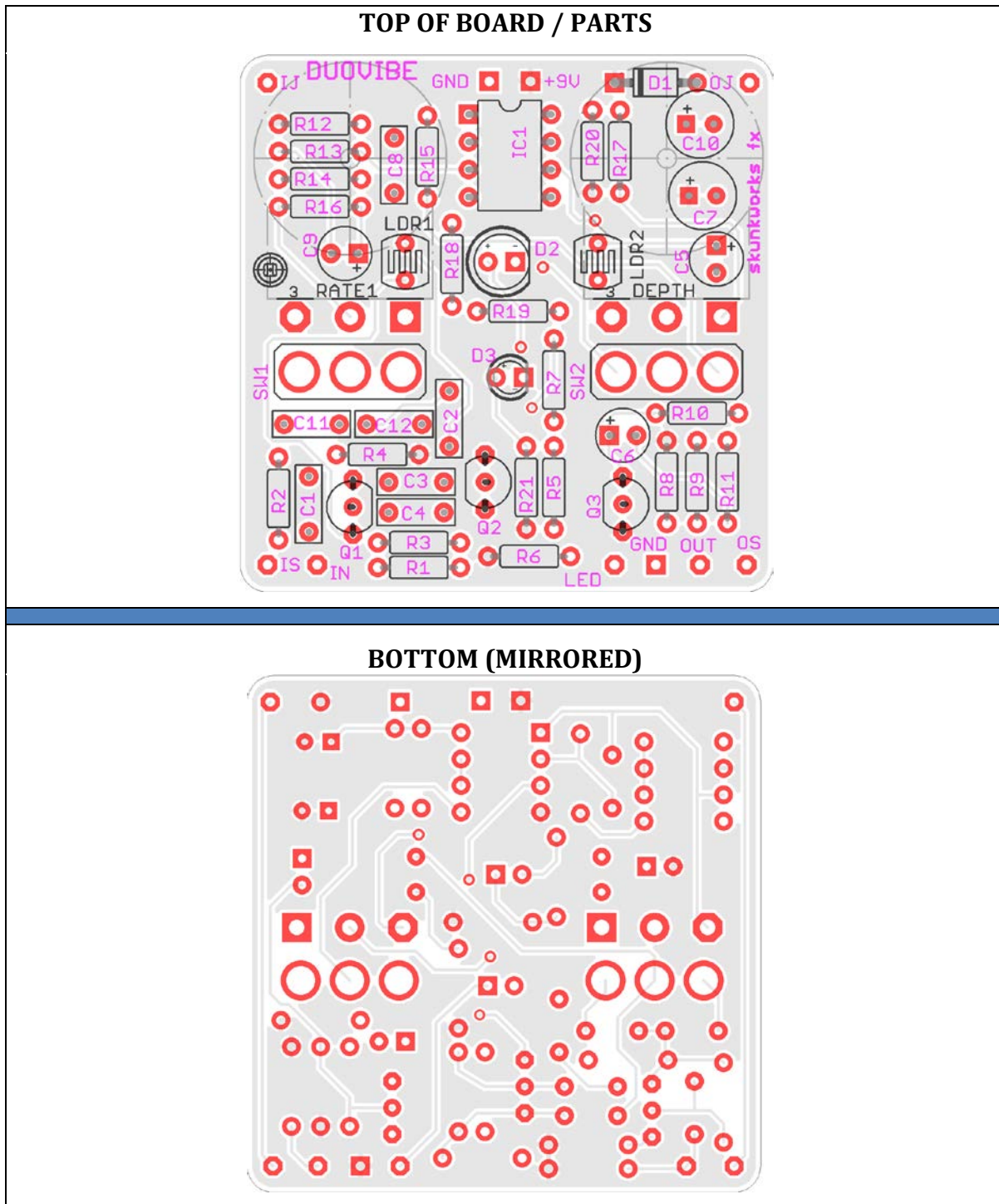
1.2 Usage of Project Materials

The circuit, name of the project, and the project PCB can all be used for any purpose. That includes commercialization though the sale of completed pedals, populated PCBs, kits of parts, reselling un-populated PCBs at a profit, or anything else you greedy would-be bourgeois pigs can dream up to make a quick buck. Knock yourself out.



2 Project Information

2.1 PCB Layout





2.2 Bill of Materials

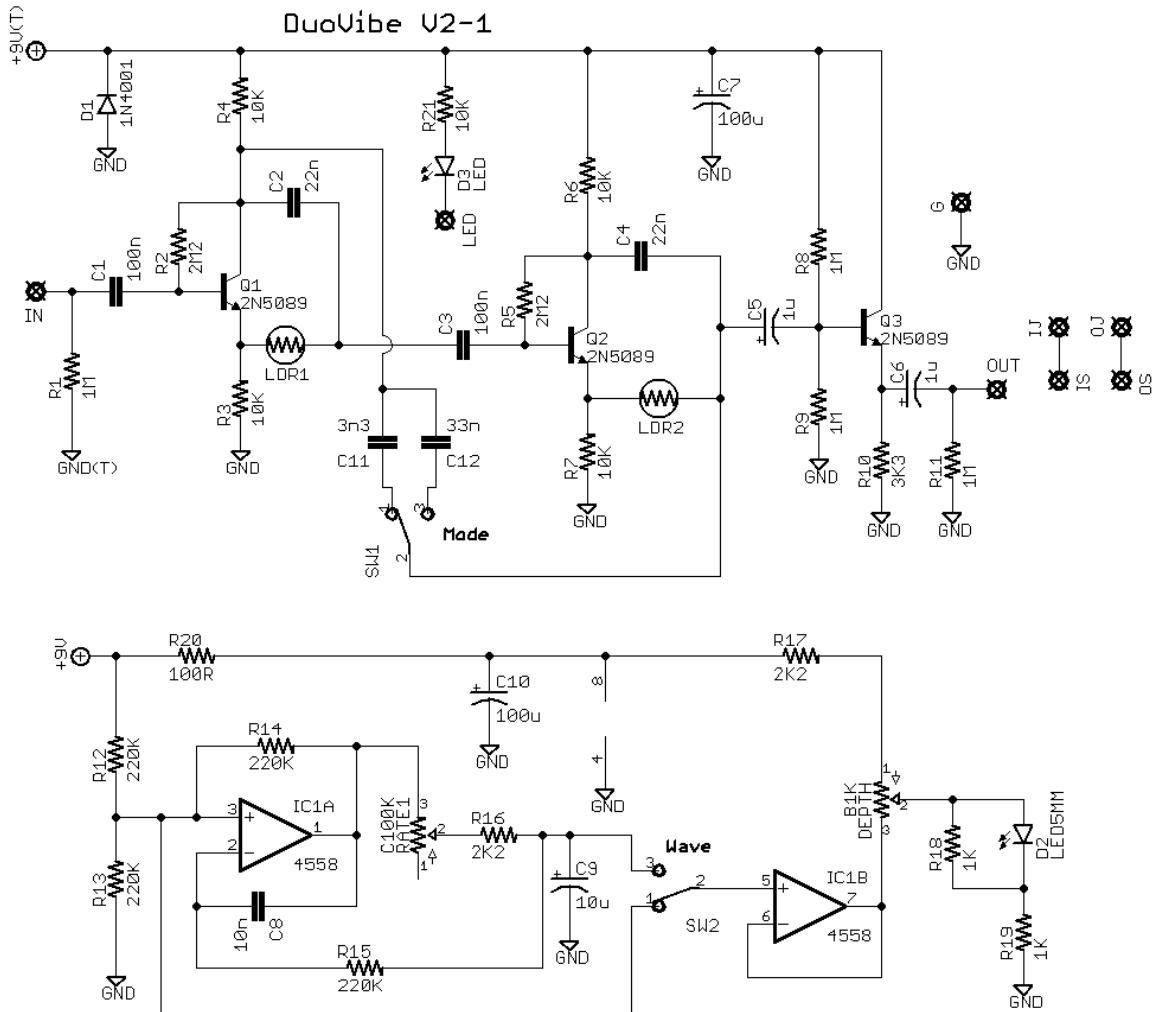
Part	Value	Package	Mouser #
R1	1M	1/4-watt	291-1M-RC
R2	2M2	1/4-watt	291-2.2M-RC
R3	10K	1/4-watt	271-10K-RC
R4	10K	1/4-watt	271-10K-RC
R5	2M2	1/4-watt	291-2.2M-RC
R6	10K	1/4-watt	271-10K-RC
R7	10K	1/4-watt	271-10K-RC
R8	1M	1/4-watt	291-1M-RC
R9	1M	1/4-watt	291-1M-RC
R10	3K3	1/4-watt	291-3.3K-RC
R11	1M	1/4-watt	291-1M-RC
R12	220K	1/4-watt	291-220K-RC
R13	220K	1/4-watt	291-220K-RC
R14	220K	1/4-watt	291-220K-RC
R15	220K	1/4-watt	291-220K-RC
R16	2K2	1/4-watt	291-2.2K-RC
R17	2K2	1/4-watt	291-2.2K-RC
R18	1K	1/4-watt	291-1K-RC
R19	1K	1/4-watt	291-1K-RC
R20	100R	1/4-watt	291-100-RC
R21	10K	1/4-watt	271-10K-RC
C1	100n	Box Cap	R82DC3100AA50J
C2	22n	Box Cap	MMK5223K63J01L16.5TR18
C3	100n	Box Cap	R82DC3100AA50J
C4	22n	Box Cap	MMK5223K63J01L16.5TR18
C5	1u	Electrolytic Cap	647-UVZ1H010MDD1TA
C6	1u	Electrolytic Cap	647-UVZ1H010MDD1TA
C7	100u	Electrolytic Cap	140-REA101M1EBK0611P
C8	10n	Box Cap	MMK5103J63J01L16.5TR18
C9	10u	Electrolytic Cap	140-REA100M1EBK0511P
C10	100u	Electrolytic Cap	140-REA101M1EBK0611P
C11	3n3	Box Cap	MMK5332K63J01L16.5TR18
C12	33n	Box Cap	MMK5333K63J01L16.5TR18
D1	1N4001	DO-41	512-1N4001
D2	LED	5MM / Diffused	WP7113GD
D3	LED	3MM	WP710A10ID5V
Q1	2N5089	TO-92	610-2N5089
Q2	2N5089	TO-92	610-2N5089
Q3	2N5089	TO-92	610-2N5089
IC1	RC4558	DIP8	595-RC4558P
LDR1	L<1K / D>1M	5MM	Smallbear: 2505 / Tayda A-1528
LDR2	L<1K / D>1M	5MM	Smallbear: 2505 / Tayda A-1528
Rate	C100K	16MM Right Angle PCB Mount	Smallbear: 1011
Depth	B1K	16MM Right Angle PCB Mount	Smallbear: 1011
SW1 (Mode)	SPDT	Solder Lug	Smallbear: 0218B
SW2 (Wave)	SPDT	Solder Lug	Smallbear: 0218B

2.2.1 Parts Substitutions

- Q1-Q3 can be a variety of part numbers. The most common subs: 2N5088, MPSA18. Other NPN transistors will likely work just fine. The board is laid out for C-B-E transistors in a TO-92 package.
- LDR1/2 should have an on (light) value of less than 1K, and an off (dark) value of greater than 1M.



2.3 Schematic





3 Build Notes

- The PCB was designed with “top mounted” input and output jacks in mind. To the end, there are extra pads that run from the top of the PCB to the bottom.

Input Jack: The pad named “IJ” (at the top) connects to the tip lug of the **Input Jack**. The pad named “IS” (at the bottom) connects to the “effect In” lug on the **Switch**.

Output Jack: The pad named “OJ” (at the top) connects to the tip lug of the **Output Jack**. The pad named “OS” (at the bottom) connects to the “effect On” lug on the **Switch**.

- D3 is the bypass indicator LED. It is situated on the board to be exactly in between the two switches. You can board-mount the LED for ease of build, or you can put the bypass indicator LED elsewhere on the enclosure, in which case simply run the positive and negative lead wires back to the corresponding pads on the board for D1.

- D2 is the LED that drives the LDRs (part of the LFO). Diffused LEDs seem to work best for smoother waveform sweeps, but water-clear LEDs can elicit more intense effects (at the cost of a somewhat lop-sided LFO sweep).

- The positioning of LDR1/2 relative to D2 affects the depth and frequency response of the vibe/phase tone. Leave some extra lead length on the LDRs and experiment with different distances to the LED, especially if you are use a water-clear LED for D2.

- C11 and C12 filter the feedback that helps make the pitch bend (vibe) or filter sweep (phase). Adjust these values to change the filter response of either or both mods. Socket the pads and go nuts.

3.1 Errata

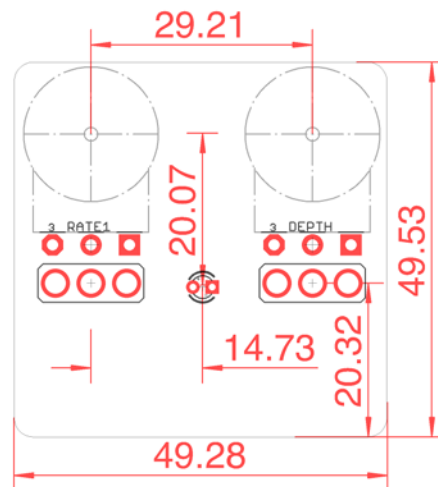
3.1.1 Bright Cap

The stock circuit is a little darker than bypass. Add a 10n cap in parallel with R3 to resolve this issue, if desired. This can be soldered directly on the board, with no need for desoldering anything or cutting traces.

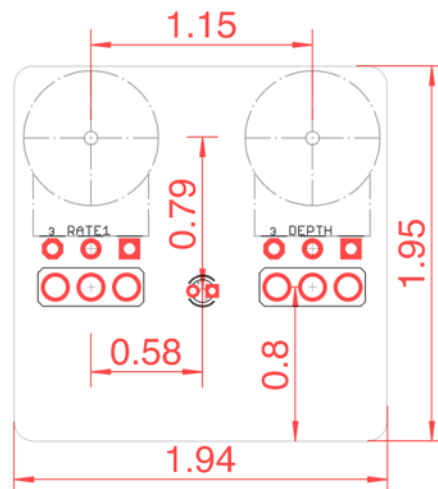


4 Drill Plan / Dimensions

Metric (MM)



Muriken! (Inches)



Hint: Print this page with no scaling for physical reference. Native resolution is 600dpi.